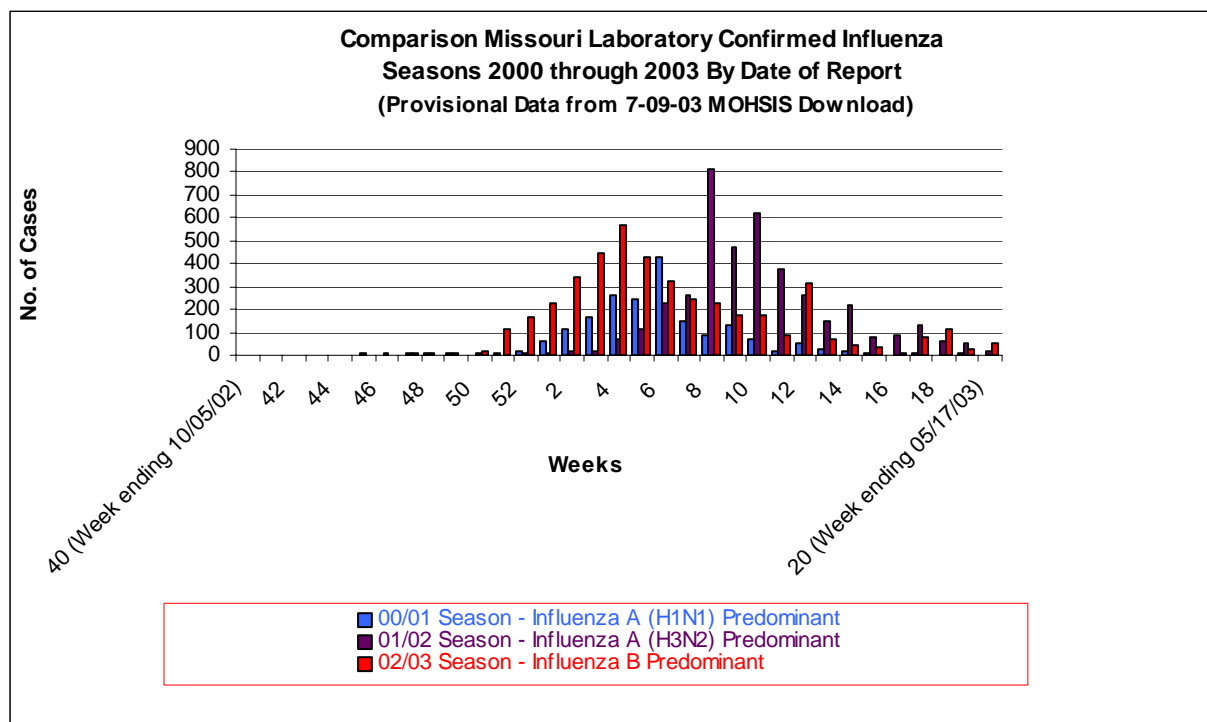


2002-2003 Influenza Season Summary
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Prevention and Care Programs
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2002-2003 Missouri Influenza Season

Synopsis

The 2002-03 influenza season was moderate to severe in Missouri. Influenza B viruses predominated and affected children and adolescents widely. Influenza B has not predominated in Missouri since 1993. Influenza A (H1N1) and influenza A (H3N2) viruses prevailed from February 2003 through May 2003. Based on data reported by the Missouri, United States Influenza Sentinel Physicians Surveillance Network (US ISPSN), the Missouri State Public Health Laboratory (SPHL), Missouri hospital laboratories and Missouri health care providers, influenza morbidity began increasing during week 50 (week ending December 14, 2002), and peaked in week four (week ending January 25, 2003). Influenza activity peaked earlier in 2002-03 than in seasons 2000-01, (week 6 ending February 10, 2001) and 2001-02, (week 8 ending February 23, 2002). Laboratory confirmed reports of influenza returned to baseline in late May 2003 (see figure 1).



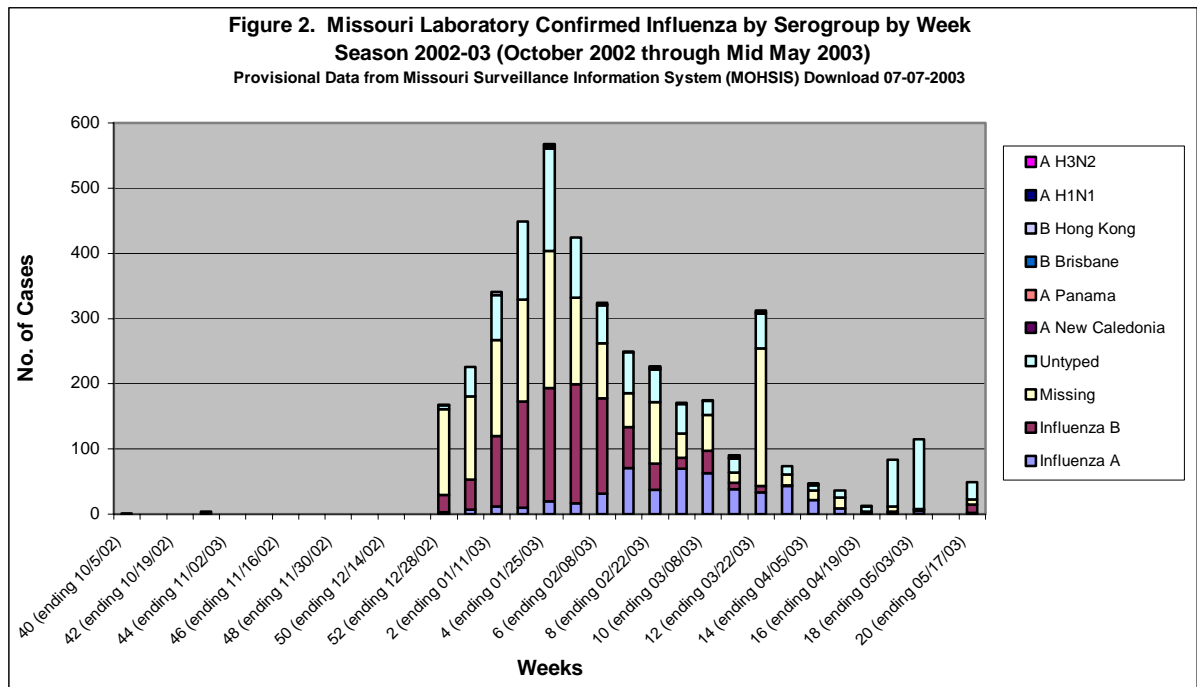
The first positive *rapid* influenza test was reported to DHSS October 2, 2002. More reports of *rapid* test positives followed sporadically in October through mid December then increased as expected in the typical seasonal trend. Because of the range of specificity and sensitivity associated with the *rapid* influenza tests, and the possibility of false positives/false negatives, DHSS waits for the first viral culture-positive influenza results to officially announce influenza activity in the state. While DHSS does not rule out the possibility of prior influenza activity, it simply reports laboratory confirmed influenza in the most accurate means currently available; viral culture is considered the “gold standard” in influenza virus testing. On December 12, 2002, a 14 year-old teenage girl from the Northwest region of Missouri was diagnosed with influenza by her physician based on clinical presentation. The physician forwarded a respiratory specimen to the State Public Health Laboratory (SPHL) for viral culture testing. Influenza B was isolated from the specimen using the viral culture method. The SPHL forwarded the specimen isolate to the Centers for Disease Control and Prevention (CDC) where it was antigenically characterized by hemagglutination-inhibition method using post-infection ferret anti-sera. CDC reported the results of this isolate as antigenically similar to the B/Hong Kong/330/2001-like virus, which was the influenza B reference strain included in the 2002-03 influenza vaccine for the Northern Hemisphere. The last laboratory-confirmed (by viral culture) case of influenza A was diagnosed on April 18, 2003; the last laboratory-confirmed (by viral culture) case of influenza B was diagnosed on March 27, 2003; and the last case of untyped influenza in Missouri was diagnosed by *rapid* test method on June 24, 2003.

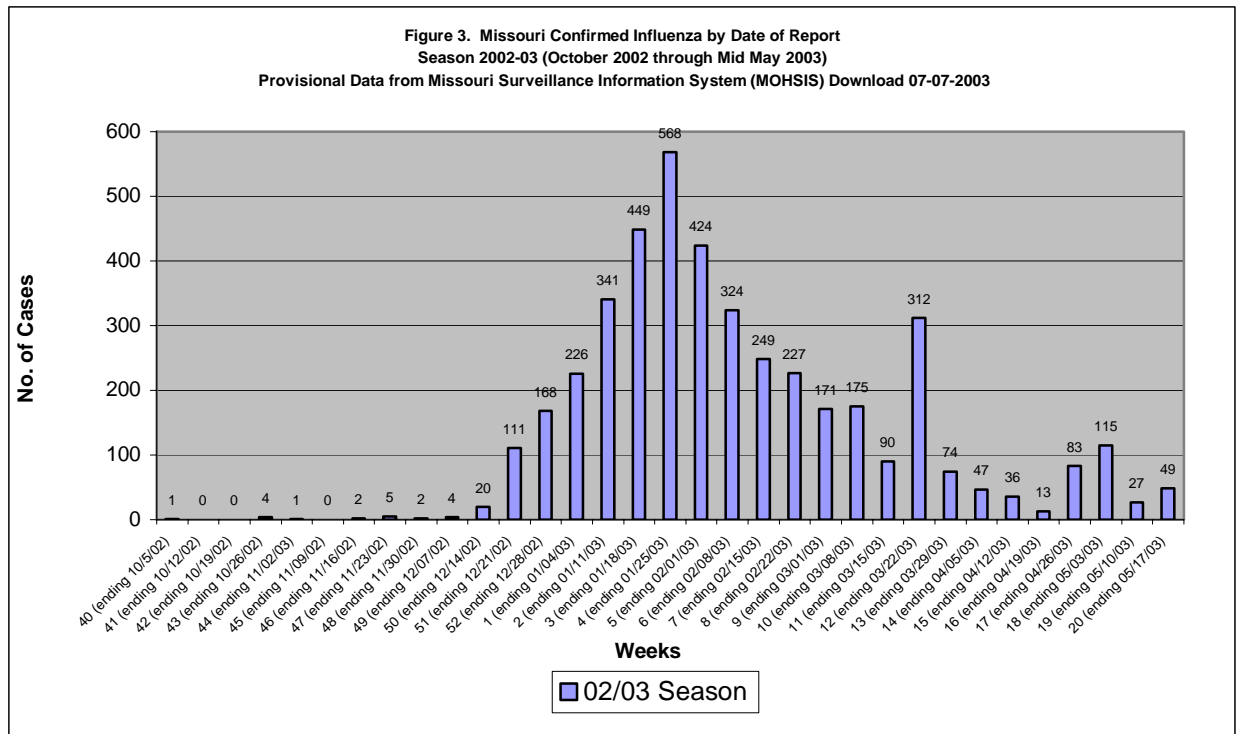
Laboratory-Confirmed Influenza Cases

There were 4,318 laboratory-confirmed cases of influenza reported between week 40 (the week ending October 5, 2002, and week 20 (the week ending May 17, 2003). Of the 4, 318 laboratory-confirmed cases, 516 (~12%) were type A. Of the confirmed influenza type A cases, 4 were sub-typed as influenza A (H3N2), and of the influenza A (H3N2) cases, 4 were antigenically characterized by CDC as A/Panama/2007/99-like (H3N2). Four were antigenically characterized as influenza A/New Caledonia/20/99-like (H1N1). There were 1,070 (~ 25%) laboratory confirmed cases of influenza B, of which 16 were antigenically characterized as B/Hong Kong/330/01-like and 7 as B/Brisbane/32/2002-like (see table 2). The remaining laboratory-confirmed cases [2,732 (~63%)] reported were diagnosed by the influenza *rapid-testing* method with type differentiation.

In October 2002, DHSS received five influenza rapid test positive reports. One positive influenza *rapid* test was reported during week 40 (week ending October 5, 2002). The number of reported laboratory confirmed cases remained below 5 per week until week 50 (week ending December 14, 2002) when reports increased to 20. A sharp increase followed during week 51 (week ending December 21, 2002), and then continued to increase dramatically through weeks 52, 1, 2, and 3 (December 22, 2002 through January 18, 2003). Reports of laboratory-confirmed influenza peaked during week 4 (week ending January 25, 2003), and then began to decline. Except for an unusual spike during week 12 (week ending March 22, 2003), reports of laboratory-confirmed influenza declined in a seesaw pattern. This spike did not represent an increase in influenza activity during that week, but rather represented a “catch up” in late

reporting by more than 30 counties. From week 13 (week ending March 29, 2003) the number of reported laboratory-confirmed influenza cases generally declined but in an up-and-down pattern through week 20 (week ending May 17, 2003), (see figure 3). Historically, the number of reported cases usually returns to baseline around week 20. The 2002-03 season followed the typical seasonal trend and returned to baseline by week 25 (week ending June 21, 2003), unlike the last year (season 2001-02) when reported cases returned to baseline as late as week 28 (week ending July 13, 2002).





The total number of laboratory-confirmed influenza cases reported were only slightly higher than the number reported the previous season. Reported laboratory-confirmed influenza cases occurred almost equally among gender, 49% (2,134) were female, 47% (2,030) were male, and gender was not identified in 4% (154) of the cases (see figure 4). Incidence of influenza in Missouri followed a characteristic pattern among the age groups typically least immunized. Numbers were highest among those aged 1 to 24 years of age. Given the focus of current immunization practices targeted toward those at high risk for influenza related complications, the low incidence of laboratory-confirmed cases reported among the elderly are remarkable. Influenza infection rates and influenza related complications are generally high among young children. Seasonal nationwide increases in hospitalizations among children one year of age and younger can be attributed to influenza and influenza-related complications. Although other respiratory viruses surface concurrently, children in Missouri were affected heavily by influenza in 2002-03. Among the laboratory-confirmed cases reported in Missouri (4,318), 82% (3,549) were among those 19 years of age or younger, a 14% increase from the previous year. This may be largely due to the fact that influenza B was the predominate influenza strain in circulation in Missouri during the 2002-03 season. Influenza B primarily affects children in general. Influenza B has not been the predominate influenza strain in Missouri since 1993. Furthermore, it is important to note that 33% (1,457) were among those aged 5 years or younger, and 13% (568) were among those aged 23 months of age or younger. School age children and teenagers are typically the group immunized against influenza. Missourians between the ages of 6 and 19 constituted 42% (1,822) of the total number of laboratory-confirmed influenza cases reported in the state during 2002-03. See figure 5.

Figure 4. Missouri Laboratory-Confirmed Influenza By Gender
2002-03 (October 2002 through Mid May 2003)

Provisional Data from Missouri Surveillance Information System (MOHSIS) Download 07-07-2003

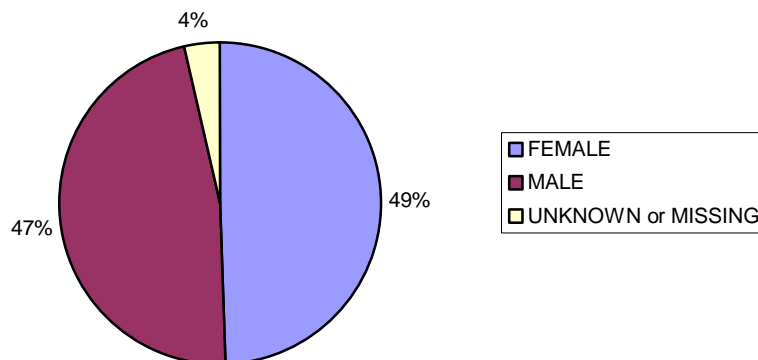
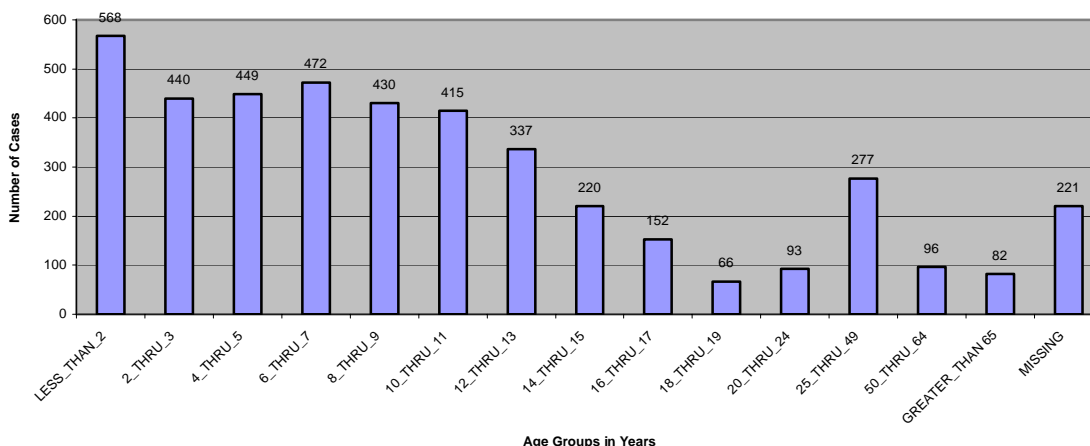


Figure 5. Missouri Laboratory-Confirmed Influenza by Age
Season 2002-03 (October 2002 through Mid May 2003)

Provisional Data from Missouri Surveillance Information System (MOHSIS) Download 07-07-03



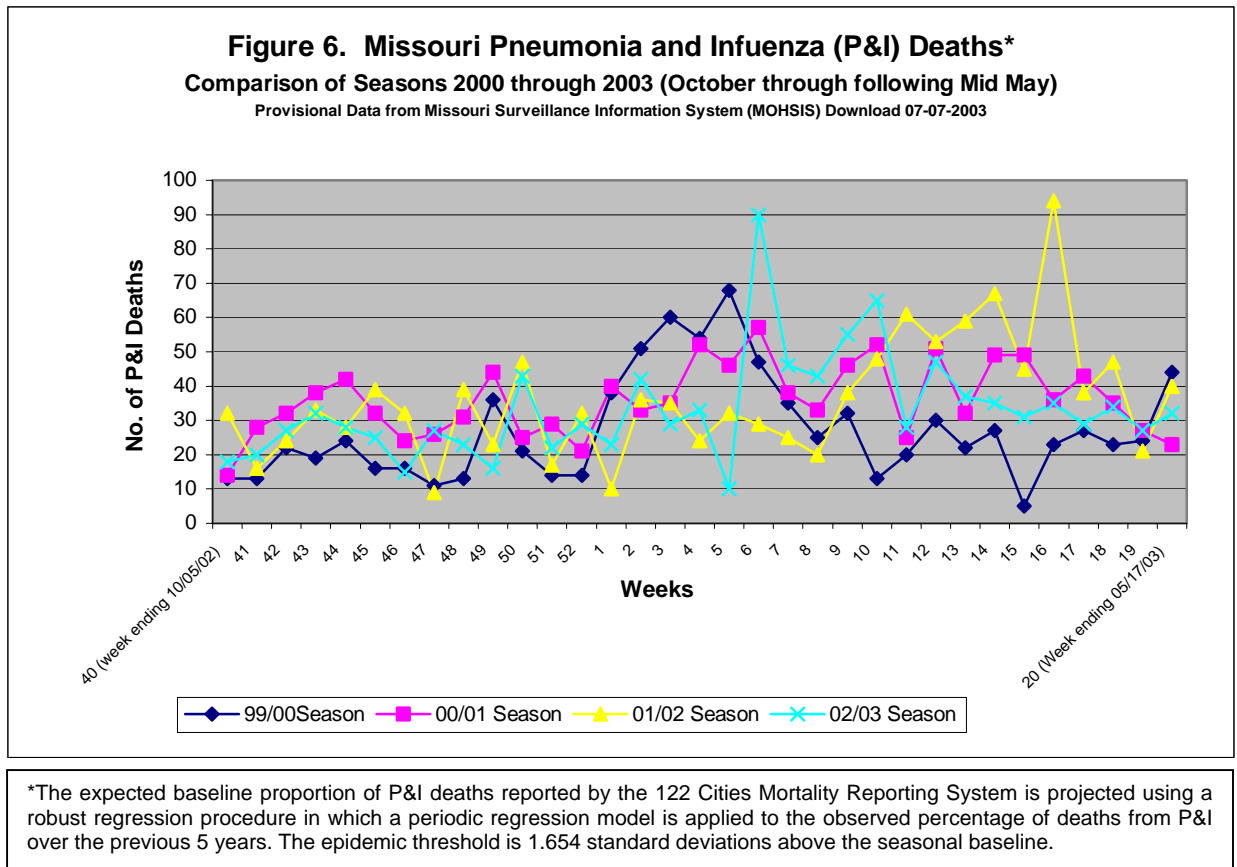
Influenza-like Illness

Missouri collected influenza-like illness data through the High Alert Sentinel Surveillance (HASS) system and is defined as influenza-like illness with malaise, headache, fever, cough, and sore throat in the absence of known cause. ILI was also collected through the United States Influenza Sentinel Physician Surveillance Network (US ISPSN), a program in which Missouri partners with Missouri physicians and CDC to conduct statewide influenza

surveillance and monitor for emerging influenza strains. Through the US ISPSN program, Missouri collects and reports ILI data from a representative sample of physicians statewide. Participating physicians report each week the total number of patients seen that week and of those seen, the number of patients seen for symptoms of ILI (meeting the CDC case definition of: fever of 100 degrees Fahrenheit or greater with cough or sore throat in the absence of a known cause). US ISPSN providers also submit respiratory specimens to the SPHL for viral isolation and analysis. Specimens tested as positive for influenza by the SPHL are forwarded to CDC for antigenic characterization. CDC publishes national and regional reports each week during influenza season based on the information communicated to them by participating US ISPSN states. The Influenza Branch at CDC uses this information to: identify when and where influenza is circulating; identify the influenza viruses that are in circulation; detect alterations in the influenza viruses; track influenza-related illness; and measure the impact of influenza morbidity in the United States.

The impact of influenza in Missouri is quantified by measuring pneumonia and influenza (P & I) deaths. P & I deaths include all deaths for which pneumonia is listed as a primary or underlying cause, or for which influenza is listed on the death certificate. Reports of P & I deaths ranged from 10 to 43 and followed an up and down pattern until a sharp increase to 90 was noted in week 6 (week ending February 8, 2003). P & I mortality peaked during week 6 (week ending February 8, 2003). An influenza morbidity peak generally follows the influenza peak by approximately 10 to 14 days. P & I deaths peaked earlier in 2002-03 than in 2001-02 and peaked the same week as in 2000-01 (see figure 6). After week 6 (week ending February 8, 2003) and throughout the remainder of the season, P & I mortality reports were up and down in a seesaw pattern between 65 and 15 deaths per week. Missouri P & I deaths remained below the 10-year median from week 10 (week ending March 8, 2003) and below the 5-year median from week 11 (week ending March 15, 2003). By week 22 (week ending May 31, 2003), P & I death reports returned to baseline. The 2002-03 P & I mortality experience in Missouri (1,096) appears slightly lower than in 2001-02 (1,193), and lower than in 2000-01(1,188). According to CDC, the percentage of P & I deaths nationwide, as reported by U.S. sentinel physicians exceeded baseline levels (0-1.9%) during the week 26 (week ending December 28, 2002) and each consecutive week during the weeks ending January 25-March 1, 2003. The entire United States national 2002-03 influenza season summary may be reviewed at:

<http://www.cdc.gov/ncidod/diseases/flu/weeklyarchives2002-2003/02-03summary.htm>.



Outbreaks of Influenza-like Illness

DHSS received three reports of community influenza outbreaks, which is considerably fewer than the ten reported last year. Children in Missouri were quite vulnerable to influenza in 2002-03. Laboratory confirmed influenza reports indicate a 14% increase among the 0-19 age group as compared to last season. As previously stated, 82% (3,549) of the reported laboratory-confirmed cases (4,318) in 2002-03 occurred among Missourians 19 years of age or younger, and 33% (568) occurred in children under age five. While these numbers are impressive, it should be noted that influenza is often diagnosed based on symptoms alone in lieu of laboratory testing. The number of school closings and absenteeism percentages paint a more accurate picture of the true impact of influenza on Missouri's children in 2002-03. Community outbreaks of influenza-like illness were reported in three head start programs, but additional childcare closures because of ILI may have been reported as part of the school closing reports. Reports of school closings were greatly increased in 2002-03. DHSS received reports of 205 ILI-related school closings this season, compared to six school closings reported in 2001-02. School closings were reported from October 14, 2002, through February 7, 2003. The majority of the school closings occurred during a two-week period with 137 (67%) closures reported in week 3 (week ending January 18, 2003) and 51 (25%) closures reported in week 4 (week ending January 25, 2003). Absenteeism ranged from 7 to 43% and classes were cancelled for 1 to 7 days. Students, faculty, and staff reported classic influenza symptoms including fevers, headache, cough, sore throat, muscle aches, malaise, and dizziness. Among the children, complaints of nausea, vomiting, and

stomachache were common. Less common among the children were reports of influenza-related pneumonia and hospitalization.

2003-04 Influenza Recommendations

CDC published the *Recommendations and Reports on Prevention and Control of Influenza for 2003-04* in the May 25, 2003 MMWR Recommendations and Reports. This publication is based on the recommendations of the Advisory Committee on Immunization Practices (ACIP).

October and November continues to be the best time to receive the influenza vaccine for those persons at increased risk for complications and persons who can transmit influenza to those at high risk for complications. Vaccination efforts in October are recommended for persons:

- 50 years of age and older
- Residents of nursing homes and other chronic-care facilities that house persons of any age who have chronic medical conditions
- Adults and children who have chronic disorders of pulmonary or cardiovascular systems, including asthma
- Adults and children who require regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medication or by human immunodeficiency virus [HIV])
- Children and adolescents (aged 6 months to 18 years) who are receiving long-term aspirin therapy and therefore may be at risk for experiencing Reye syndrome after influenza infection
- Women who will be in the second or third trimester of pregnancy during the influenza season
- Persons who can transmit influenza virus to persons at high risk for complications, such as:
 - Healthcare workers, including physicians, nurses, hospital and outpatient workers
 - Emergency response workers, including emergency medical technicians, paramedics, and first responders
 - Employees of nursing homes and chronic-care facilities who have contact with the residents
 - Employees of assisted-living and other residences for persons in groups at high risk
 - Persons who provide home care to persons in groups at high risk
 - Household contacts of persons in groups at high risk

Because children age 0 to 23 months of age are at increased risk for influenza-related hospitalizations and because influenza vaccines have not been approved by the U.S. Food and Drug Administration (FDA) for use among children less than 6 months of age, vaccination is encouraged for their household contacts and out-of-home caregivers.

Vaccination of children age 9 or younger who are receiving influenza vaccine for the first time, should also be vaccinated in October because those children will need a booster dose one month after the initial dose.

Efforts to vaccinate other persons who wish to decrease their risk for influenza infection should begin in November and continue throughout the remainder of the influenza season.

2003-04 Influenza Vaccine Composition

The 2003-2004 trivalent vaccine will consist of: an A/New Caledonia/20/99 (H1N1) strain, an A/Panama/2007/99 (H3N2), (an A/Moscow/10/99-like virus) strain, and a B/Hong Kong/330/2001-like virus strain.